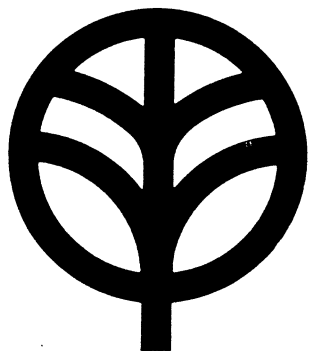




KENWOOD
HI/FI STEREO COMPONENTS

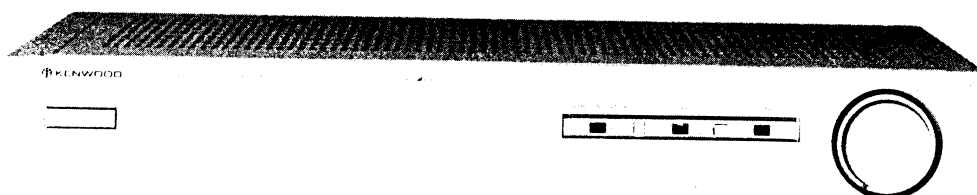
SERVICE MANUAL

KA-80

An item of adjustment is written in three languages — English, French and German.

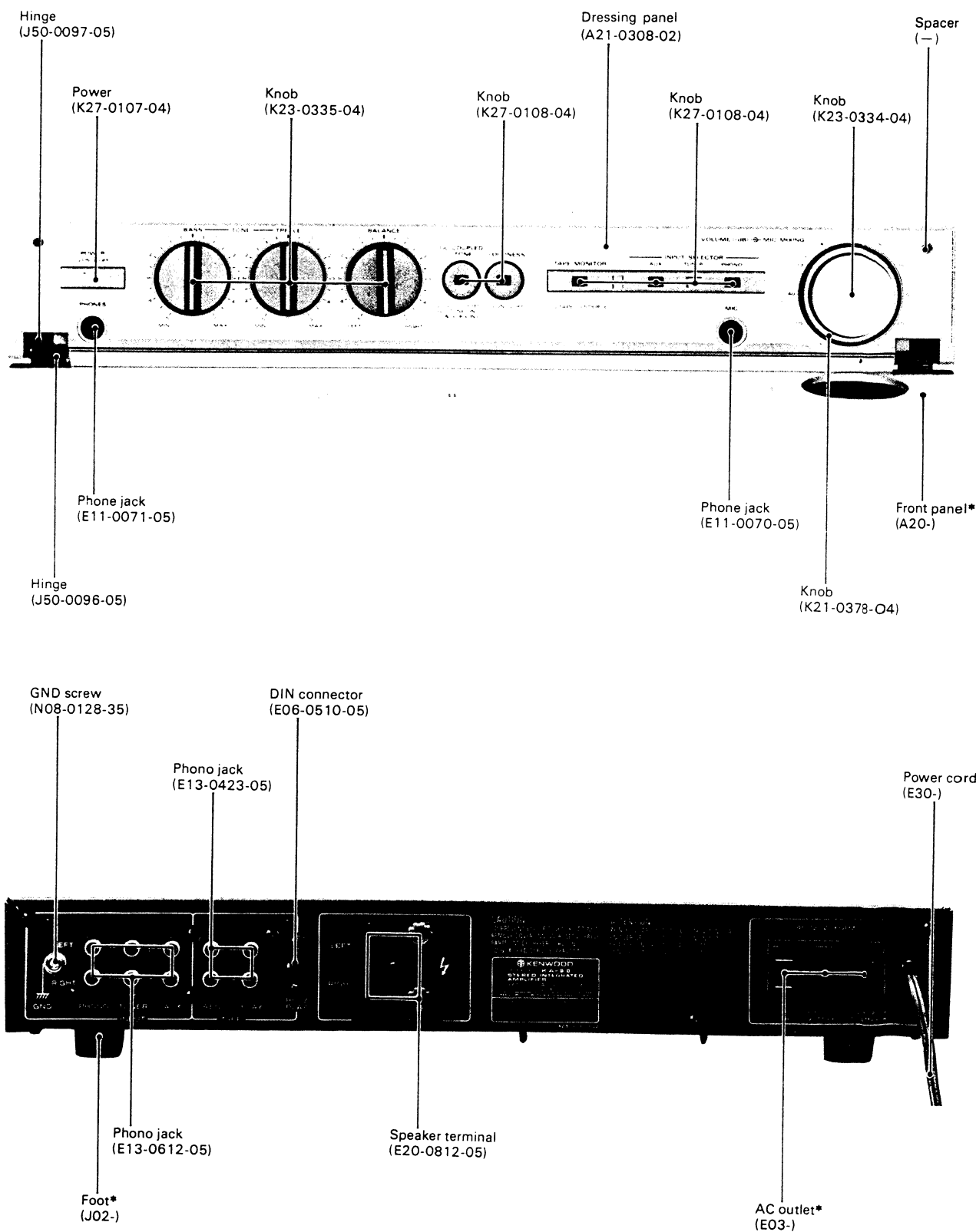
Un article sur réglages est écrit en trois langues, Anglais, Français et Allemand.

Ein Artikel der Abgleich wird auf drei Sprachen, Englische, Französisch und Deutsch geschrieben.



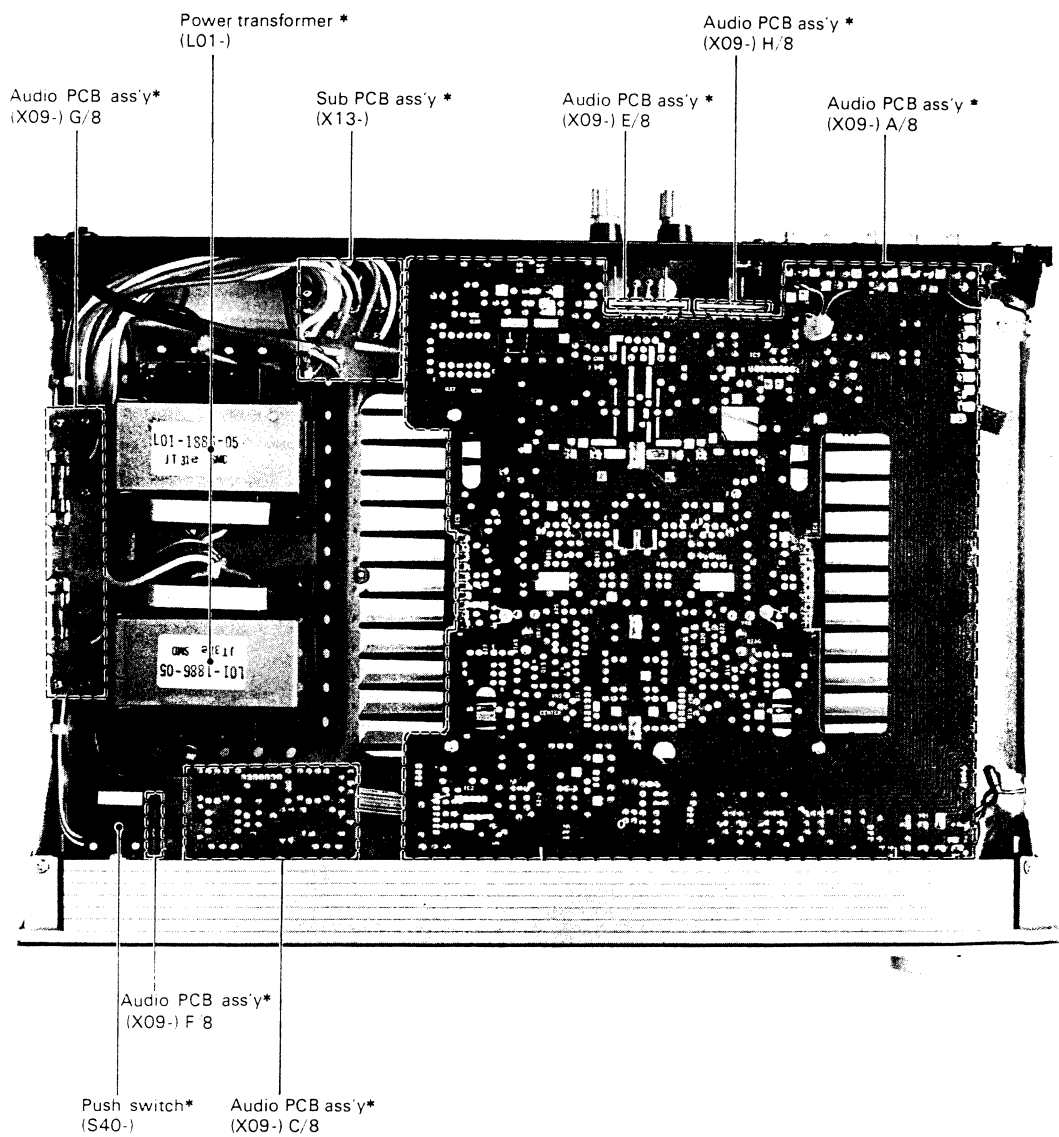
HIGH SPEED DC STEREO INTEGRATED AMPLIFIER

EXTERNAL VIEW



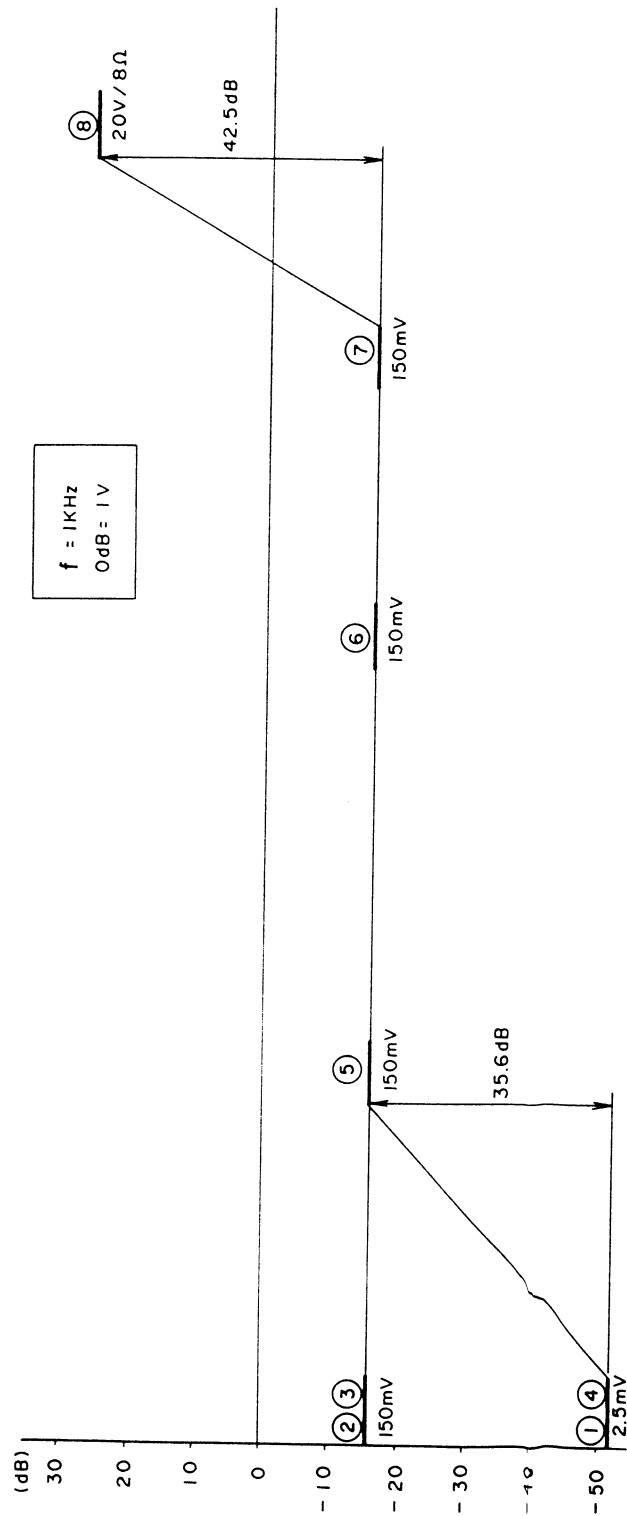
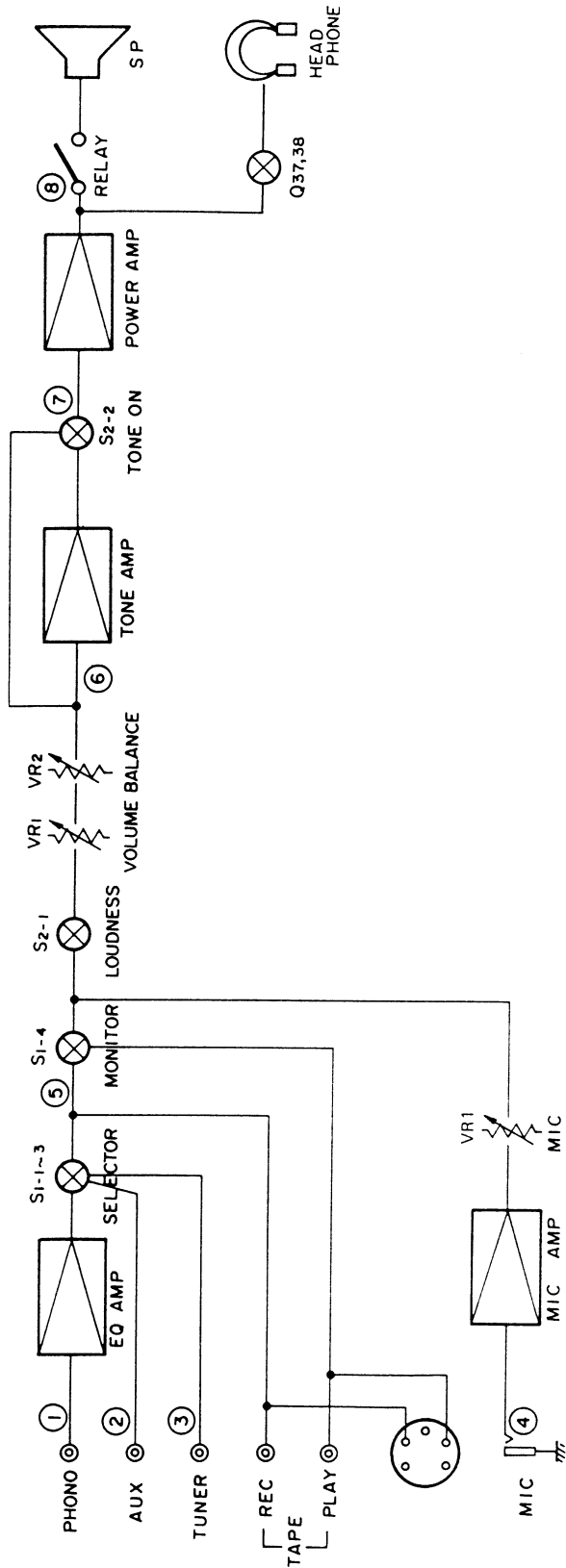
* Refer to Parts List.

INTERNAL VIEW



* Refer to Parts List.

BLOCK AND LEVEL DIAGRAMS



CIRCUIT DESCRIPTION

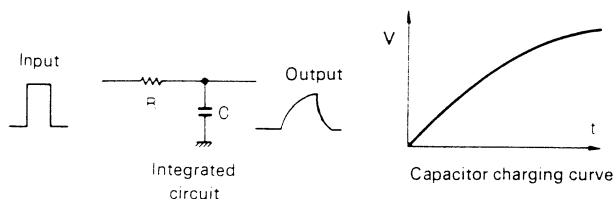
The amplifier should just amplify the signal as it was input and drive the loudspeaker. However, the amplifier has a time lag with certain amount of time constant, resulting in a different waveforms at the input and output terminals. In order to obtain the output waveform which is identical with that of the input, the response of the amplifier should be speeded up. That is, the signal rise time is made small and the slew rate is made large.

Increase of amplification stages and extension of band width in the amplifier tend to cause an oscillation in the high frequency range. To prevent the oscillation the phase characteristics is modified using capacitors at several places in the circuit. (Capacitance is also created by the layout and the wiring of component parts.)

However, the capacitance adversely affects the speedup of the circuit, resulting in a further deformation of the output waveform. Therefore, the phase compensating capacitance must be as small as possible.

HIGH SPEED Circuit and Phase Compensation

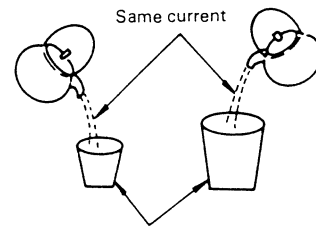
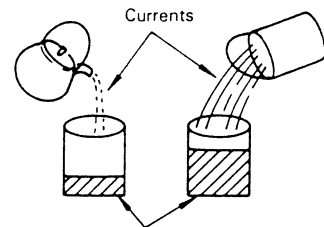
Because of the frequency characteristics of the amplifier itself, as mentioned previously, the signal amplitude decreases as the frequency goes higher. A well designed amplifier shows a frequency characteristics which does not change regardless of the output voltage, and it is similar to the characteristics of a single stage RC integrated circuit.



When a sharp-edged pulse as shown in the above figure is applied to the integrated circuit, the rises voltage across the capacitor C cannot change instantaneously, and the output voltage rises gradually as C is charged.

This C corresponding to the total capacitance of the amplifier determines the cutoff frequency, and it is also influential for the rise time of the signal. (It is also required to make resistance R small.) The phase compensating capacitor which relates to the slew rate is assumed to be included in the C .

In order to speed up the output response, it is necessary to minimize the charging time (i.e. small time constant) by reducing the capacitance and/or resistance.

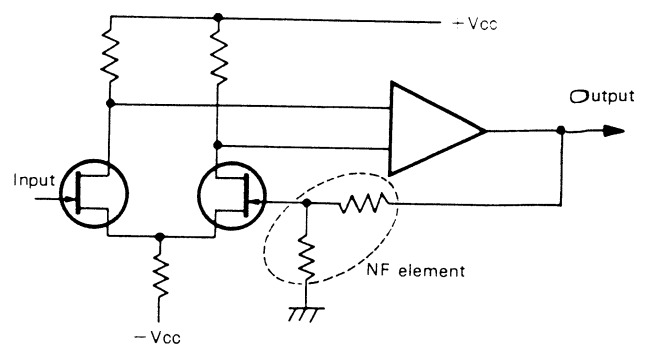


For words "slew rate" and "rise time", see L-05M Service Manual.

In model KA-80, the negative feedback is used in both the voltage amplification stage and the current amplification stage separately to speed up the amplifier response. This makes the phase compensating capacitor small and thus the circuit time constant becomes small, resulting in a short rise time and a large slew rate.

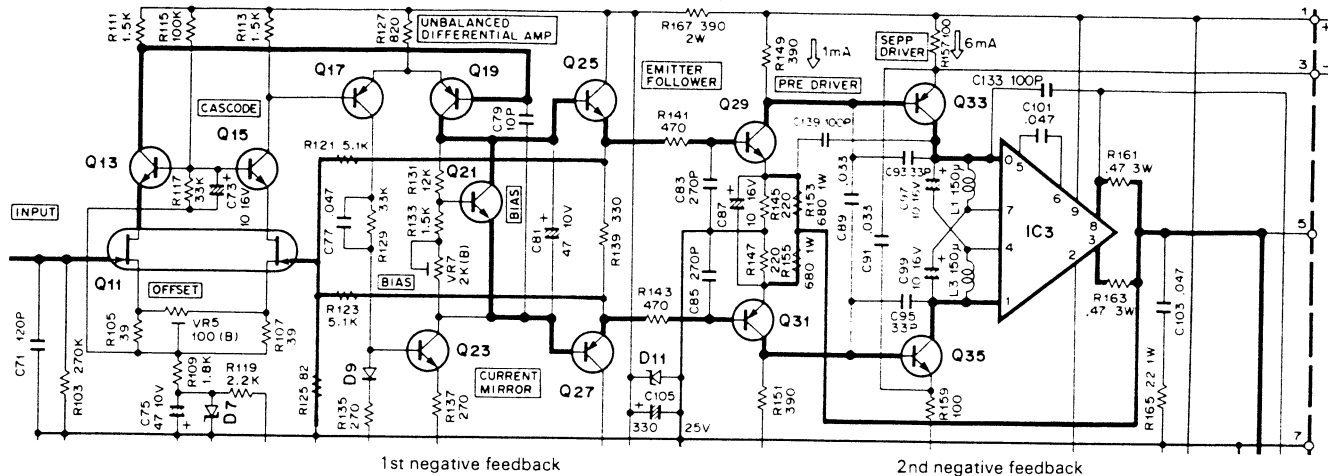
Dual Negative Feedback

In model KA-80, a negative feedback signal from the loudspeaker terminal is applied to the emitters of the pre-driver transistors and another feedback signals from their bases to the gate of the FET in the input differential amplifier.



Conventional negative feedback

CIRCUIT DESCRIPTION



Negative feedback in model KA-80

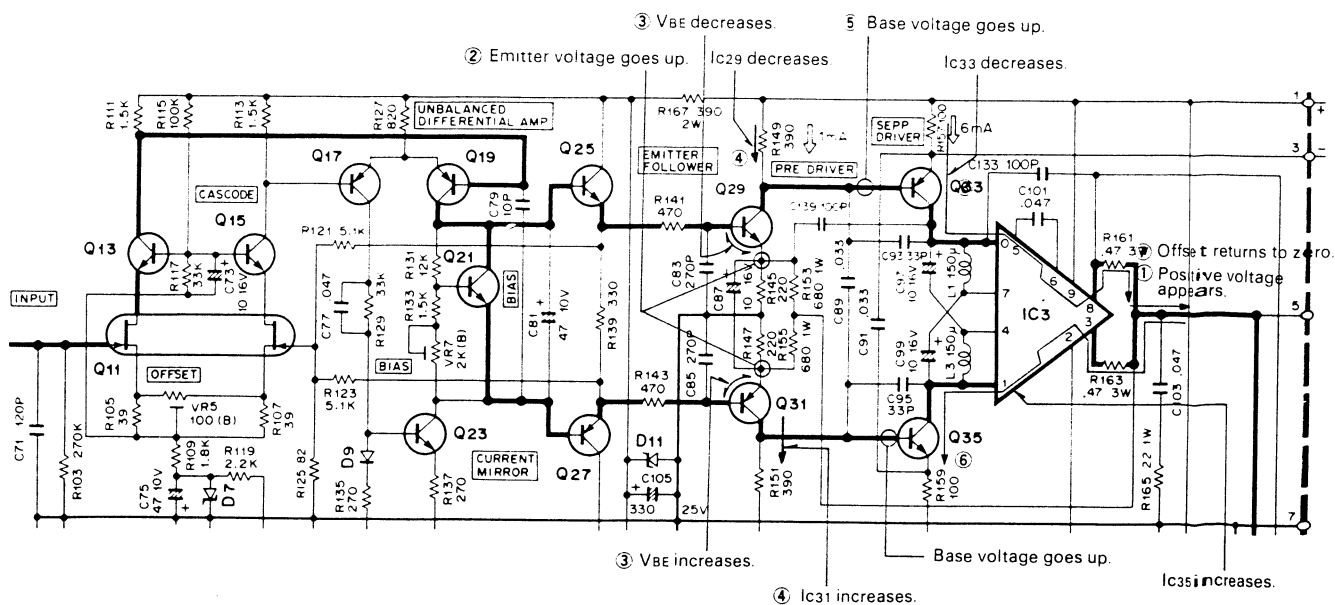
Let's see how the offset voltage at the output terminal can be maintained at zero level.

Assume that a positive voltage appears at the output terminal (①). This voltage is divided by the resistors and applied to the emitters of predrivers Q29 and Q31 (②). The base voltage of the Q29 and Q31 is constant, since it is supplied from the stabilized DC amplifier of the previous stage (comprising Q13, Q15, Q17, Q19, Q21, Q23, Q25, and Q27).

The voltage applied to the emitters of Q29 and Q31 cause to

lower the V_{BE} of Q29 (③), then the collector current of Q29 decreases (④) and the current of the positive complementary circuit also decreases (⑥).

On the other hand, the V_{BE} of Q31 increases (③), and the current of the negative complementary circuit also increases (⑥). Therefore, an increase of the negative current cancels the positive voltage on the output terminal, thus maintaining a zero offset (⑦).



CIRCUIT DESCRIPTION

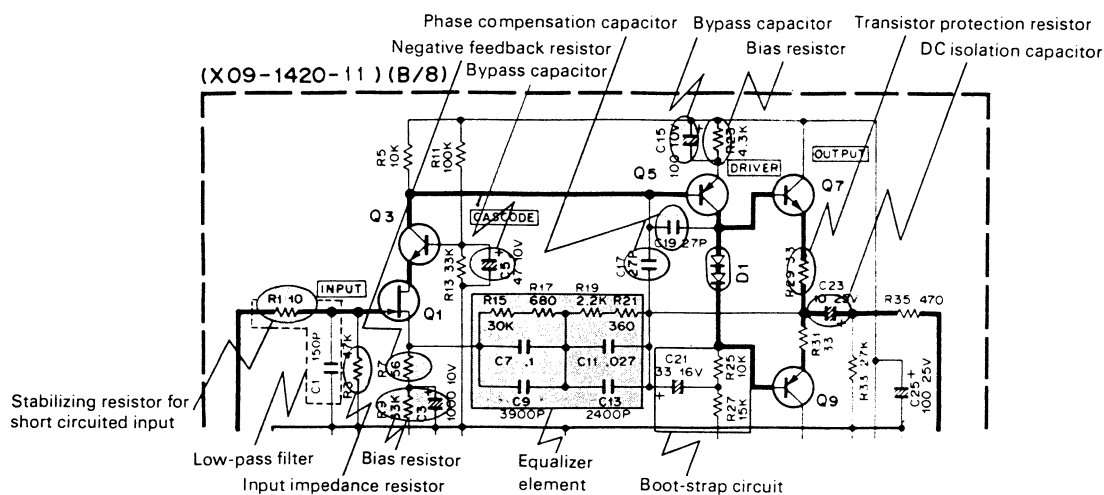
Assume that the power is switched ON. The power voltage is distributed throughout the circuit and also applied to the base of Q39. This is because pin 1 of IC5 does not fall to the GND immediately. (For further details, see KA-801 Service Manual.)

Therefore, no voltage is applied to the bases of Q37 and Q38, i.e. these transistors are in cutoff state, and the headphone does not emit any sound at all.

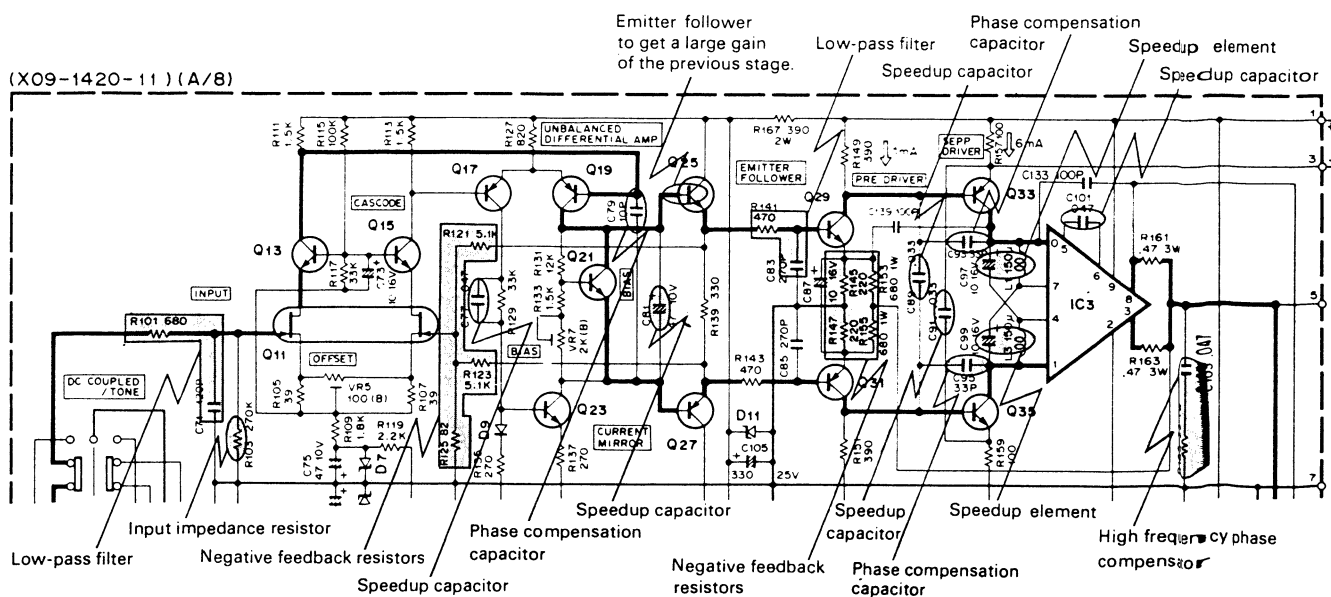
After a while, pin 1 of IC5 falls to the GND, and C109 starts to charge. When the C109 is fully charged, the base voltage of Q39 goes down which means the base-emitter will be

forwardly biased and the transistor turns ON. Then, +Vcc is applied through resistors to the bases of Q37 and Q38. These transistors turn ON, and the headphone is activated. When the power is switched OFF, the discharging current flows through R179 to cut off Q39 immediately, and emission of noise is prevented in the same manner as in the power ON sequence.

The headphone jack also functions as the power switch for the relay, which is deenergized when the headphone plug is inserted. Thus, the loudspeaker does not emit any noise at this moment.

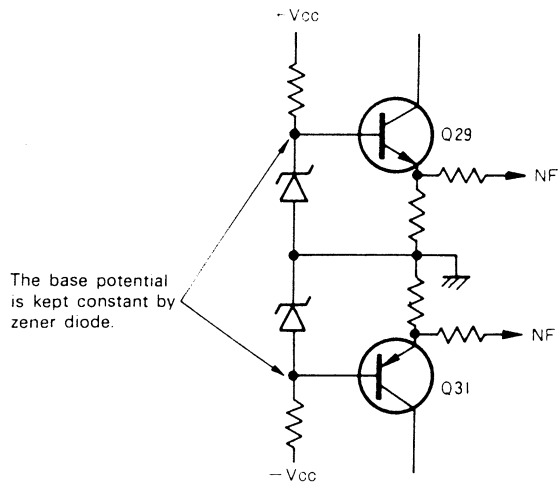


Preamplifier Circuit Diagram



Power Amplifier Circuit Diagram

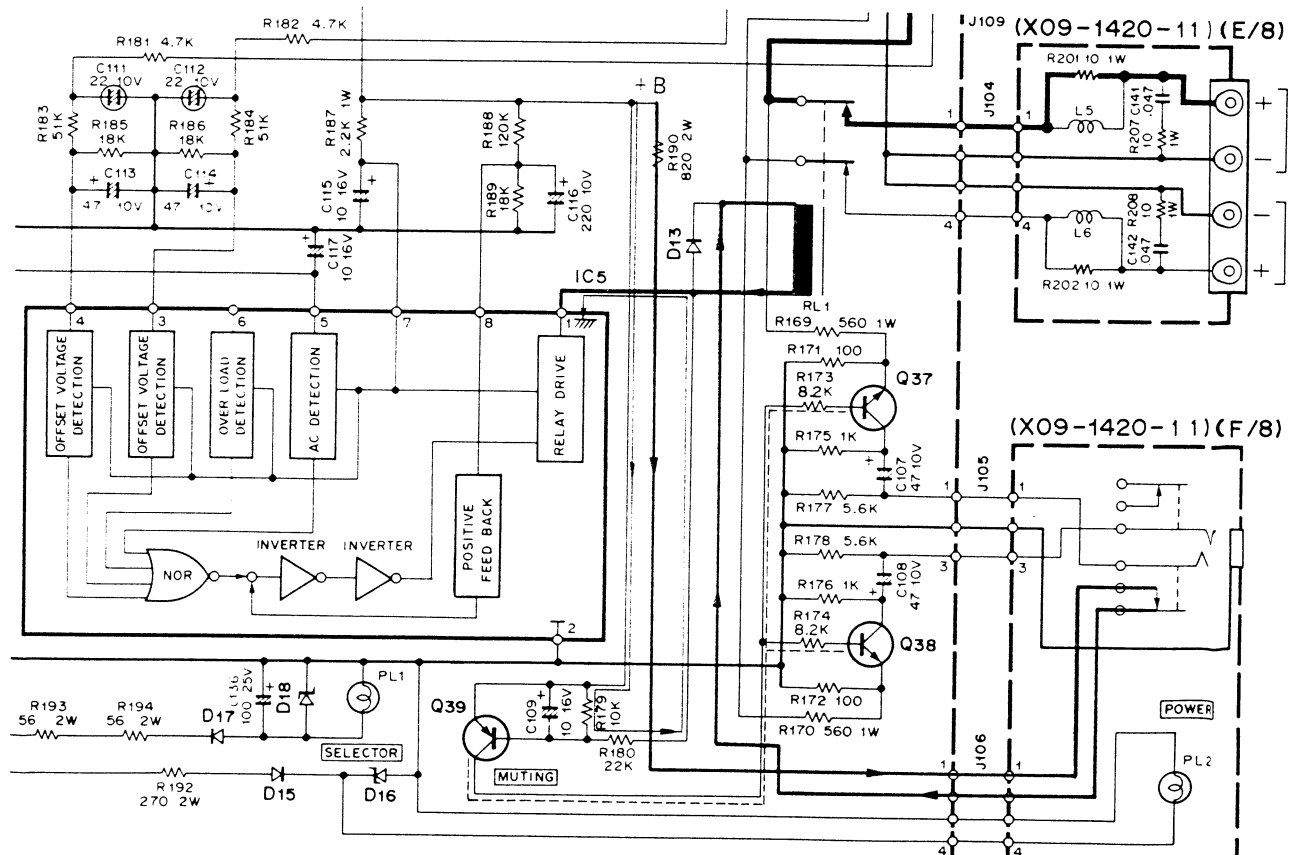
CIRCUIT DESCRIPTION



The bases of Q29 and Q31 are fixed.

Headphone Muting Circuit

Transistors Q37, Q38, and Q39 form a circuit to prevent the power-ON switching noise to let out from the headphone. The circuit consists of a time lag circuit using Q39 and transistor switches Q37 and Q38.



ADJUSTMENT/RÉGLAGES/ABGLEICH

POWER AMP OFFSET VOLTAGE ADJUSTMENT

1. Connect the DC voltmeter between the positive and negative speaker terminals.
2. Adjust the trimming pot VR5 (VR6) for a 0V reading of the DC voltmeter.

RÉGLAGE DE LA TENSION DE DECALAGE (OFFSET)

1. Brancher le voltmètre de c.c. aux bornes de sortie + et -.
2. Régler le potentiomètre ajustable VR5 (VR6) pour que la tension de sortie soit nulle.

OFFSET-SPANNUNG DER ENDVERSTÄRKER

1. Den Gleichspannungsmesser zwischen den Lautsprecherklemmen + und - der endverstärker anschließen.
2. Die Regelstange durch das Unterplattenloch einführen und den halbeingebetteten Widerstand VR5 (VR6) so regulieren, daß die Gleichspannungsmesser-Ablesung 0V ist.

BIAS CURRENT ADJUSTMENT

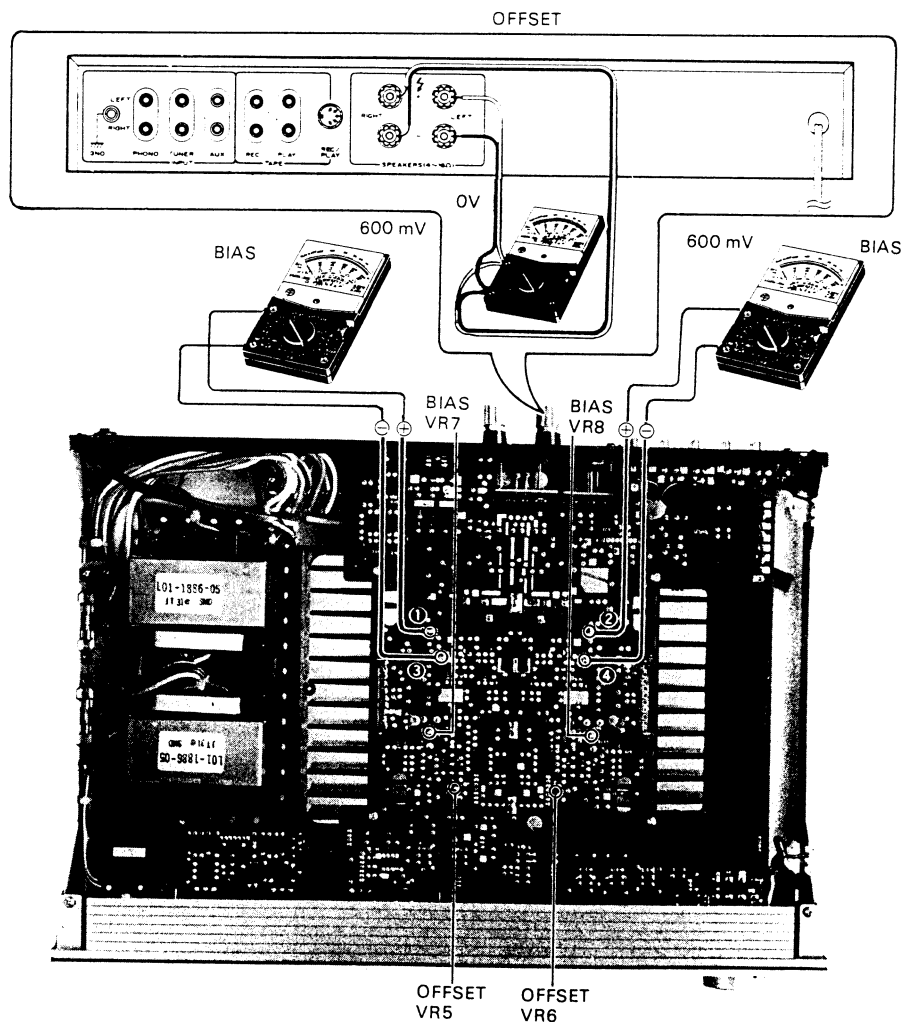
1. Turn the volume control knob fully counter clockwise.
2. Connect the DC voltmeter between the adjusting points ❶ and ❸ (❷ and ❹) of power amp pc board ass'y (X09-1420-11).
3. Adjust the BIAS CURRENT trimming pot VR7 (VR8), for a 600 mV reading of the voltmeter.

RÉGLAGE DU COURANT DE POLARISATION

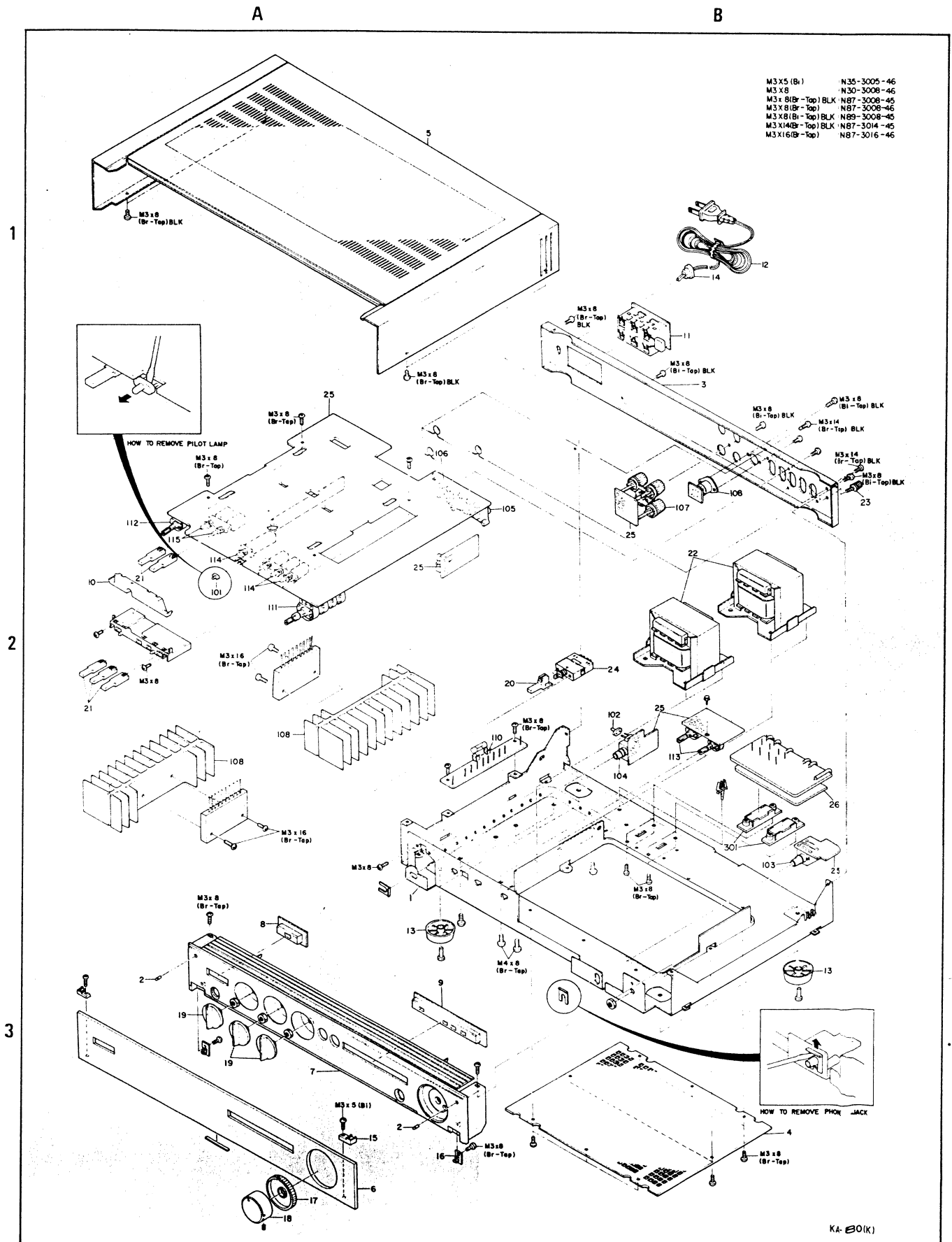
1. Tourner le bouton de commande de volume à fond dans le sens invers de celui des aiguilles d'une montre.
2. Brancher le voltmètre de c.c. aux points d'alignement ❶ et ❸ (❷ et ❹), sur la plaque circuit imprimé d'ampli de puissance (X09-1420-11).
3. Réguler le potentiomètre ajustable VR7 (VR8) de façon à ce que le voltmètre de c.c. indique 600 mV.

LEERLAUFS

1. Den Lautstärkeregler (VOLUME) drehen um die Leistungsverstärker-Aufnahme auf Null zu reduzieren.
2. Den Gleichspannungsmesser zwischen der Regulierungs-Punkte ❶ und ❸ (❷ und ❹) der endverstärker anschließen.
3. Den halbeingebetteten Widerstand VR7 (VR8) der Leistungsverstärker so regulieren, daß die Gleichspannungsmesser-Ablesung 600 mV ist.

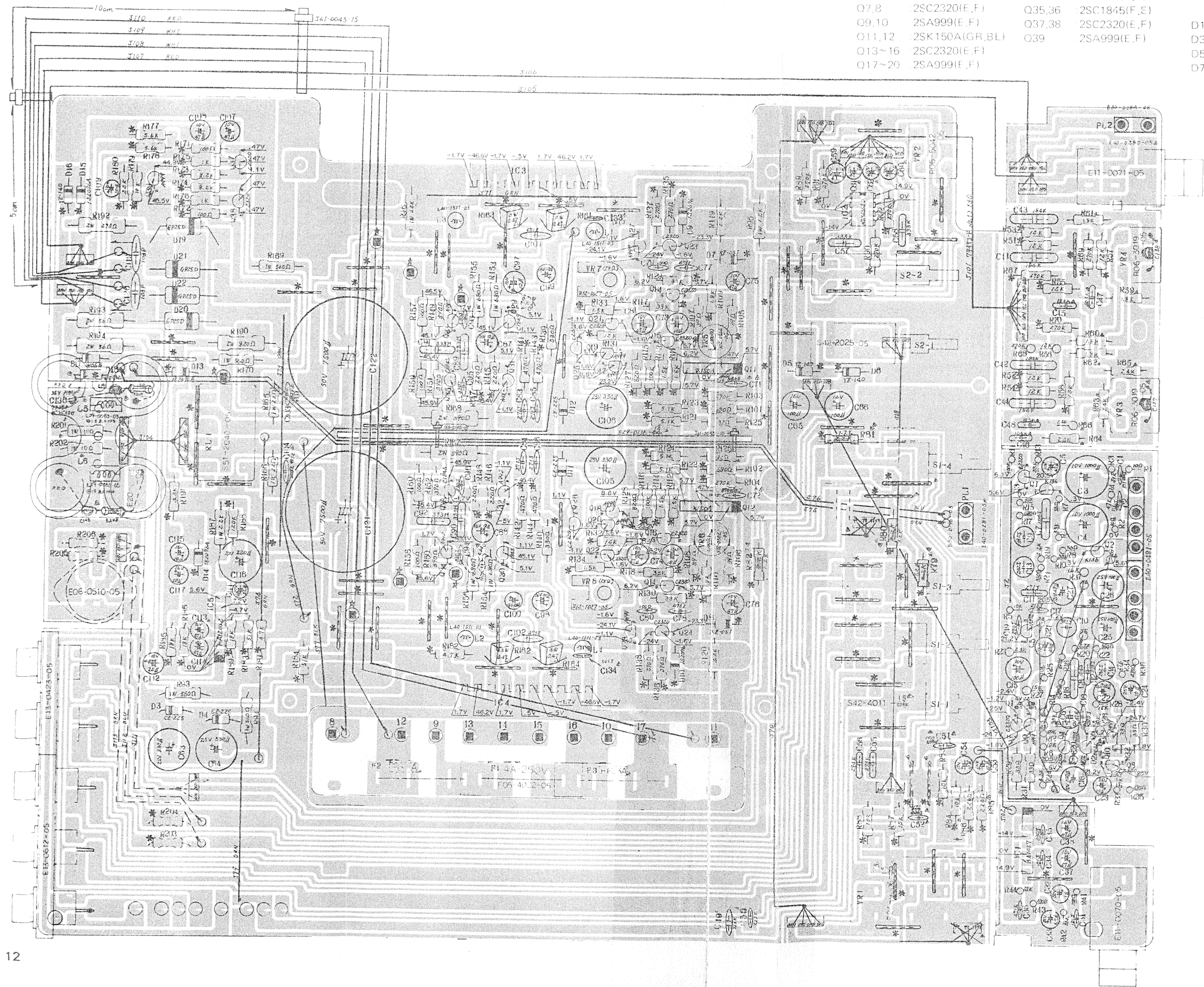


EXPLODED VIEW



PC BOARD

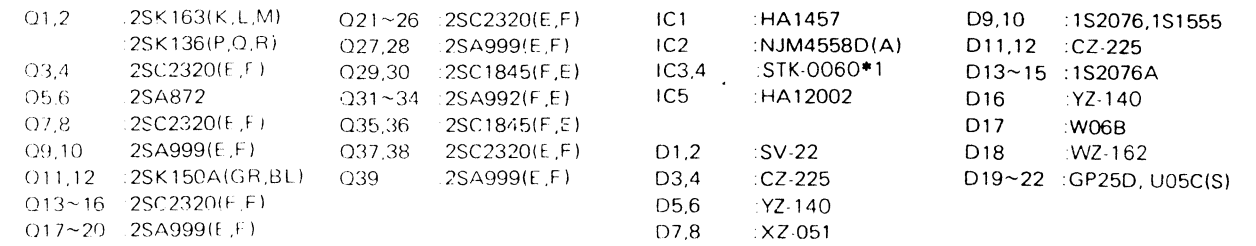
AUDIO (X09-142x-xx) COMPONENT SIDE

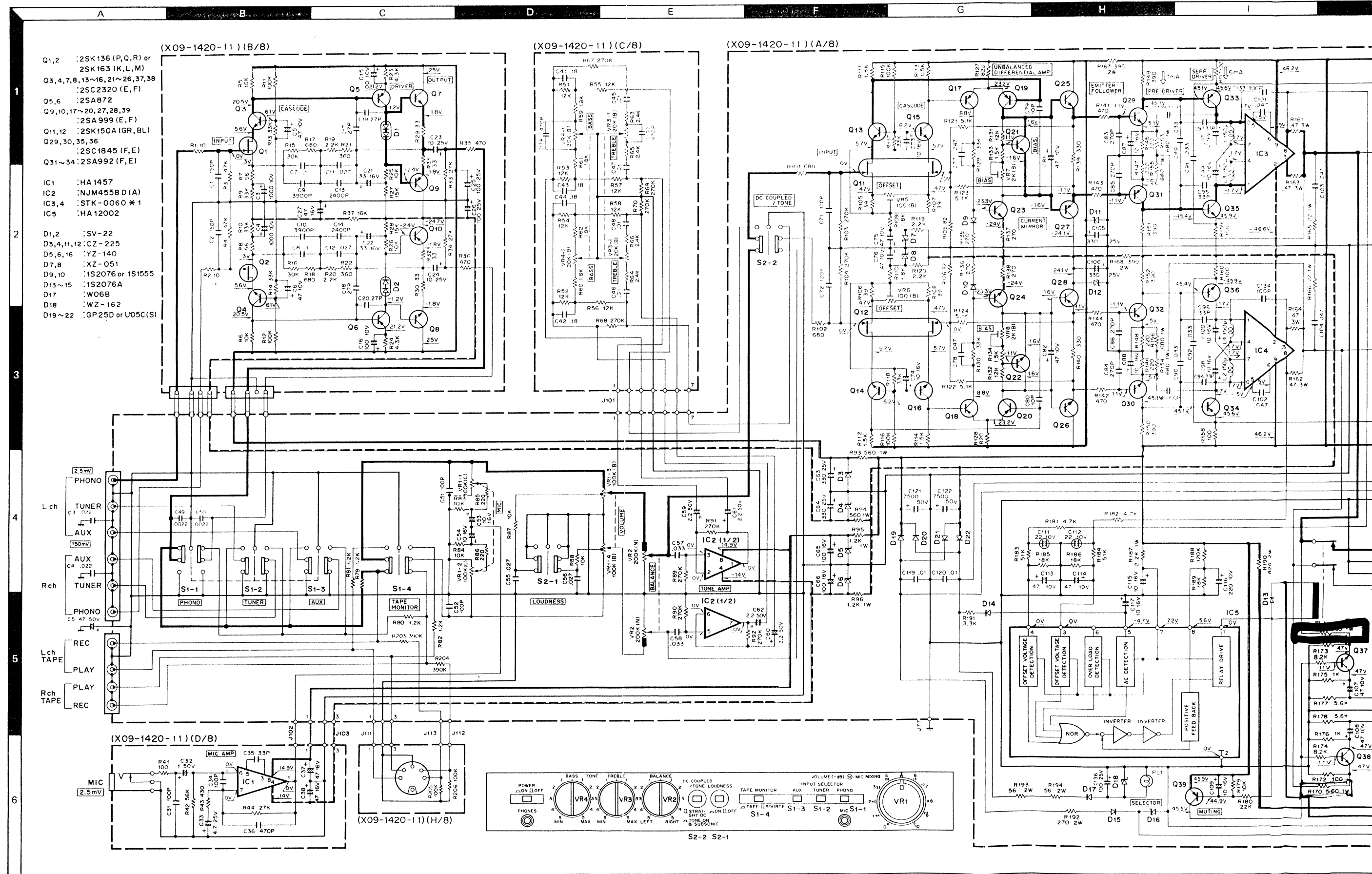


- | | | | | | | | |
|--------|----------------|--------|--------------|-------|-------------|--------|----------------|
| Q1,2 | 2SK163(K,L,M) | Q21~26 | 2SC2320(E,F) | IC1 | HA1457 | D9,10 | 1S2076,1S1555 |
| | 2SK136(P,Q,R) | Q27,28 | 2SA999(E,F) | IC2 | NJM4558D(A) | D11,12 | CZ-225 |
| Q3,4 | 2SC2320(E,F) | Q29,30 | 2SC1845(F,E) | IC3,4 | STK-0060*1 | D13~15 | 1S2076A |
| Q5,6 | 2SA872 | Q31~34 | 2SA992(F,E) | IC5 | HA12002 | D16 | YZ-140 |
| Q7,8 | 2SC2320(E,F) | Q35,36 | 2SC1845(F,E) | | | D17 | W06B |
| Q9,10 | 2SA999(E,F) | Q37,38 | 2SC2320(E,F) | D1,2 | SV-22 | D18 | WZ-162 |
| Q11,12 | 2SK150A(IG,BL) | Q39 | 2SA999(E,F) | D3,4 | CZ-225 | D19~22 | GP25D, U05C(S) |
| Q13~16 | 2SC2320(E,F) | | | D5,6 | YZ-140 | | |
| Q17~20 | 2SA999(E,F) | | | D7,8 | XZ-051 | | |

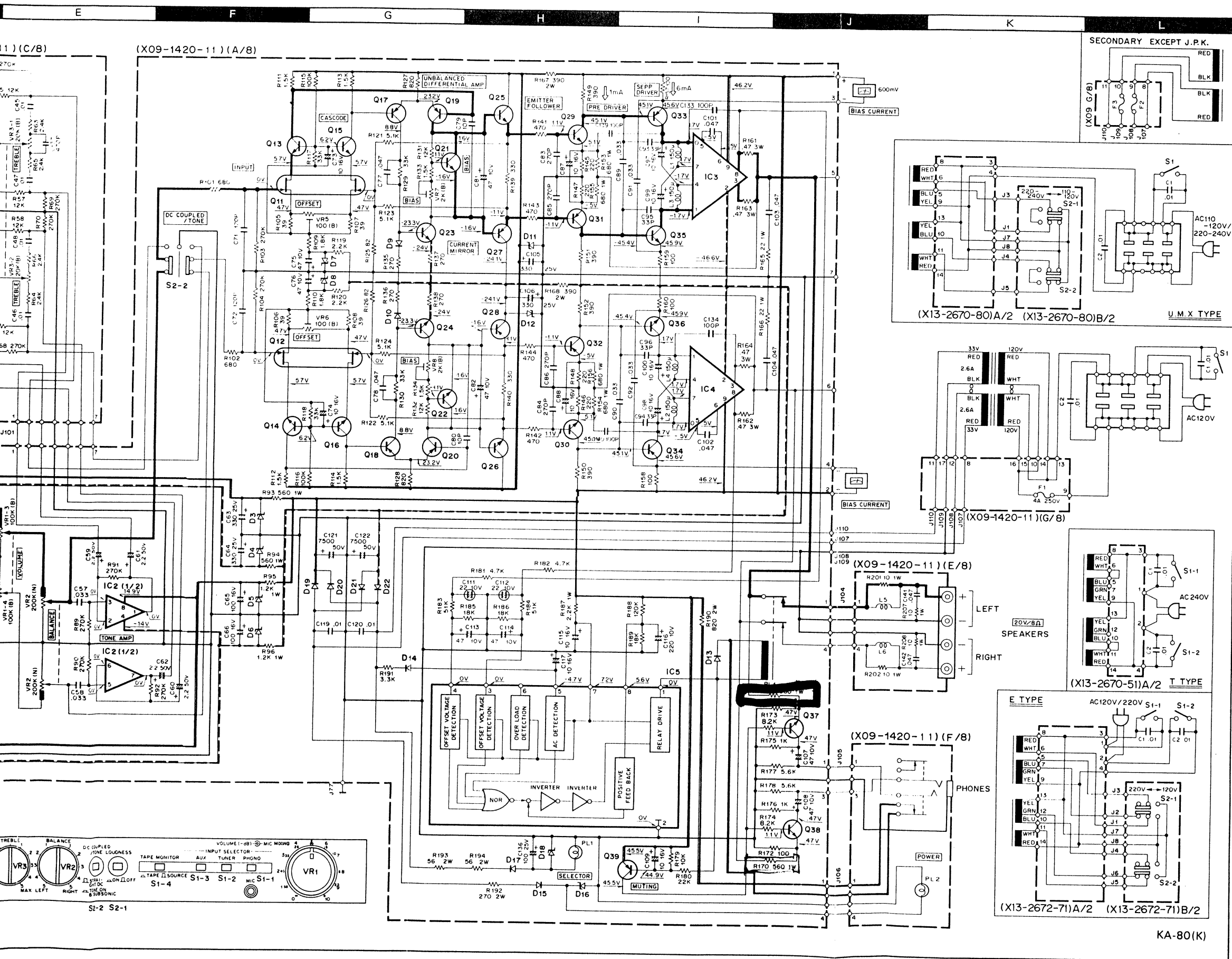
Q · IC	VR · S
	VR2
Q37, IC3	
Q39, IC2	
Q38	
Q27,23	VR4
	VR7
Q13	
Q33,29,21	
Q15	VR5
Q25	
Q19	
Q17,11	
Q35,31	VR3
Q3, 1	
Q36,32, Q12	
Q18	
Q26, Q20	
Q16, Q2	VR6
Q34,30, Q22	
Q14	VR8
IC5	
Q28,24, Q5	
IC4	
Q7,9,10	
Q4,6	
Q8	
IC1	
	VR1

AUDIO (X09-142x-xx) COMPONENT SIDE

12



HIGH SPEED DC STEREO INTEGRATED AMPLIFIER



SPECIFICATIONS

Power output	48 watts per channel minimum RMS, both channels driven, at 8 ohms from 20Hz to 20,000Hz with no more than 0.02% total harmonic distortion.
Both Channels Driven	50 + 50 watts 8 ohms at 1,000 Hz 55 + 55 watts 4 ohms at 1,000 Hz
Total Harmonic Distortion (20 Hz to 20,000 Hz)	0.02% at rated power into 8 ohms 0.015% at 1/2 rated power into 8 ohms
AUX input to SPEAKER output	0.02% at rated power into 8 ohms 0.015% at 1/2 rated power into 8 ohms
PHONO input to SPEAKER output	0.02% at rated power with VOLUME -20 dB
Intermodulation Distortion (60 Hz : 7 kHz = 4 : 1)	0.0065% at rated power into 8 ohms
Damping Factor	120, DC - 20,000 Hz into 8 ohms
Transient Response	
Rise Time	0.8 μs
Slew Rate	±150 V/μs
Power Bandwidth	5 Hz to 40,000 Hz at 0.05% T.H.D.
Frequency Response	
(DC COUPLED at ON)	DC to 450 kHz, -3 dB
(DC COUPLED at OFF)	18 Hz to 100 kHz, -3 dB
Speaker Impedance	Accept 4 ohms to 16 ohms
Input Sensitivity/Impedance	
Phono	2.5 mV/50 kohms
Tuner, AUX, Tape	150 mV/50 kohms
Signal to Noise Ratio (IHF, A)	
Phono	86 dB for 2.5 mV input 92 dB for 5.0 mV input 98 dB for 10 mV input
Tuner, AUX, Tape	106 dB for 150 mV input
Phono Maximum Input Level	230 mV (RMS), T.H.D. 0.02% at 1,000 Hz
Output Level/Impedance	
Tape REC (Pin)	150 mV/220 ohms
(DIN)	30 mV/75 kohms
Phono Frequency Response	RIAA standard curve ±0.3 dB (20 Hz to 20,000 Hz)
Tone Control	
Bass	±10 dB at 100 Hz
Treble	±10 dB at 10 kHz
Loudness Control	+9 dB at 100 Hz (at -30 dB VOLUME Level)
Subsonic Filter	18 Hz/6 dB

GENERAL

Power Requirement	60 Hz 120V (U.S.A. & Canada Model) or 50/60 Hz 110-120V/220-240V, switchable
Power Consumption	450 watts at full power
A.C. Outlet	Switched 2, Unswitched 1
Dimensions	W 440 mm (17-5/16") H 78 mm (3-1/16") D 330 mm (13")
Weight (Net)	7.9 kg (17.4 lbs)

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

PARTS LIST

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名 / 規格	Re- marks 備考
TOTAL			
1 3A	-	MAIN CHASSIS	
2 3A	-	SPACER	
3 1B	-	REAR PANEL	
4 3B	-	BOTTOM PLATE	
5 1A	A01-0361-02	METALLIC CABINET	*P
6 3A	A20-1527-02	FRONT PANEL	MX
6 3A	A20-1527-02	FRONT PANEL	UE
6 3A	A20-1527-02	FRONT PANEL	K
6 3A	A20-1527-02	FRONT PANEL	
6 3A	A20-1528-02	FRONT PANEL	*T
7 3A	A21-0308-02	DRESSING PANEL	
8 3A	B07-0288-04	ESCUTCHEON	*
9 3A	B07-0289-04	ESCUTCHEON	*
-	B46-0055-20	WARRANTY CARD	P
-	B46-0060-00	WARRANTY CARD	T
-	B46-0061-20	WARRANTY CARD	K
-	B46-0062-20	WARRANTY CARD	U
-	B46-0063-00	WARRANTY CARD	U
-	B46-0064-10	WARRANTY CARD	X
-	B50-3045-00	INSTRUCTION MANUAL	*P
-	B50-3045-00	INSTRUCTION MANUAL	MX
-	B50-3046-00	INSTRUCTION MANUAL	KU
-	B50-3047-00	INSTRUCTION MANUAL	T
-	B50-3060-00	INSTRUCTION MANUAL	E
-	B59-0018-00	SERVICE STATIONS' LIST	
10 2A	B19-0208-03	LIGHT ACRYL BOARD	*
C1 ,2	C54-3310-39	CERAMIC 0.01UF P	ET
C1 ,2	C91-0023-05	CERAMIC 0.01UF AC250V	UM
C1 ,2	C91-0023-05	CERAMIC 0.01UF AC250V	X
C1 ,2	C91-0079-05	CERAMIC 0.01UF AC125V	KP
C3 ,4	C55-1722-38	CERAMIC 0.022UF Z	
C5	C24-1747-41	ELECTRO 0.47UF 50WV	
11 1B	E03-0007-05	AC OUTLET	KU
11 1B	E03-0007-05	AC OUTLET	MX
11 1B	E03-0009-05	AC OUTLET	P
12 1B	E30-0181-05	POWER CORD	KP
12 1B	E30-0185-05	POWER CORD	X
12 1B	E30-0459-05	POWER CORD	E
12 1B	E30-0515-05	POWER CORD	UM
12 1B	E30-0602-05	POWER CORD	T
-	H01-3065-04	CARTON BOX	*P
-	H01-3066-04	CARTON BOX	UM
-	H01-3066-04	CARTON BOX	XK
-	H01-3067-04	CARTON BOX	E
-	H01-3086-04	CARTON BOX	T
-	H10-1538-03	POLYSTYRENE FIXTURE	
-	H25-0078-04	BAG	
-	H25-0179-04	BAG	
13 3B	J02-0088-05	FOOT	K
13 3B	J02-0089-05	FOOT	PU
13 3B	J02-0089-05	FOOT	MX
13 3B	J02-0089-05	FOOT	ET
14 1B	J41-0024-15	BUSHING	XT
14 1B	J41-0033-05	BUSHING	UM
14 1B	J41-0033-05	BUSHING	E
14 1B	J41-0033-05	BUSHING	KP
15 3A	J50-0096-05	HINGE	*
16 3A	J50-0097-05	HINGE	*

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名 / 規格	Re- marks 備考
17 3A	K21-0378-04	KNOB(MIC)	*
18 3A	K23-0334-04	KNOB(VOLUME)	*
19 3A	K23-0335-04	KNOB(TONE,BALANCE)	
20 2B	K27-0107-04	KNOB(POWER)	
21 2A	K27-0108-04	KNOB(PUSHBUTTON)	
22 2B	L01-1881-05	POWER TRANSFORMER	*K
22 2B	L01-1885-05	POWER TRANSFORMER	UM
22 2B	L01-1885-05	POWER TRANSFORMER	X
22 2B	L01-1886-05	POWER TRANSFORMER	ET
22 2B	L01-1888-05	POWER TRANSFORMER	P
23 2B	N08-0128-35	GND SCREW	
S1	S40-1010-05	PUSH SWITCH FIG24	UM
S1	S40-1010-05	PUSH SWITCH FIG24	X
S1	S40-1011-05	PUSH SWITCH FIG24	K
S1	S40-2085-05	PUSH SWITCH FIG24	P
S1	S40-2099-05	PUSH SWITCH FIG24	ET
25 1A	X09-1420-11	AUDIO AMP PCB ASSY	*K
25 1A	X09-1420-11	AUDIO AMP PCB ASSY	P
25 1A	X09-1420-81	AUDIO AMP PCB ASSY	UM
25 1A	X09-1420-81	AUDIO AMP PCB ASSY	X
25 1A	X09-1422-71	AUDIO AMP PCB ASSY	ET
26 2B	X13-2670-51	SUB PCB ASSY	*T
26 2B	X13-2670-80	SUB PCB ASSY	UM
26 2B	X13-2670-80	SUB PCB ASSY	X
26 2B	X13-2672-71	SUB PCB ASSY	E
AUDIO (X09-142x-xx)			
PL1 101	B30-0196-05	LAMP(12V,100MA)	
PL2 102	B30-0084-05	LAMP(8V,50MA)	
C1 ,2	C71-1715-15	CERAMIC 150PF J	
C3 ,4	C24-1010-81	ELECTRO 1000UF 10WV	
C5 ,6	C24-1047-61	ELECTRO 47UF 10WV	
C7 ,8	C46-1710-45	MYLAR 0.1UF J	
C9 ,10	C47-1739-25	POLYSTY 3900PF J	
C11 ,12	C46-1727-35	MYLAR 0.027UF J	
C13 ,14	C47-1724-25	POLYSTY 2400P J	
C15 ,16	C24-1010-71	ELECTRO 100UF 10WV	
C17 ,20	C71-1727-05	CERAMIC 27PF J	
C21 ,22	C24-1233-61	ELECTRO 33UF 10WV	
C23 ,24	C25-1410-67	LL-ELEC 10UF 25WV	
C25 ,26	C24-1410-71	ELECTRO 100UF 25WV	
C27	C24-1247-61	ELECTRO 47UF 10WV	
C31	C71-1710-15	CERAMIC 100PF J	
C32	C24-1710-51	ELECTRO 1UF 50WV	
C33	C24-1447-51	ELECTRO 4.7UF 25WV	
C34	C71-1710-15	CERAMIC 100PF J	
C35	C71-1733-05	CERAMIC 33PF J	
C36	C52-1747-16	CERAMIC 470PF K	
C37 ,38	C24-1247-61	ELECTRO 47UF 10WV	
C41 ,44	C46-1718-46	MYLAR 0.18UF K	
C45 ,48	C46-1710-36	MYLAR 0.01UF K	
C49 ,50	C52-1722-26	CERAMIC 0.0022UF K	
C51 ,52	C71-1710-15	CERAMIC 100PF J	
C53 ,54	C24-1210-61	ELECTRO 10UF 10WV	
C55 ,56	C46-1727-36	MYLAR 0.027UF K	
C57 ,58	C46-1733-36	MYLAR 0.033UF K	
C59 ,62	C24-1722-51	ELECTRO 2.2UF 50WV	
C63 ,64	C24-1433-71	ELECTRO 330UF 25WV	
C65 ,66	C24-1210-71	ELECTRO 100UF 10WV	
C71 ,72	C71-1712-15	CERAMIC 120PF J	
C73 ,74	C24-1210-61	ELECTRO 10UF 10WV	
C75 ,76	C24-1047-61	ELECTRO 47UF 10WV	

Refer to exploded view on P10.

PARTS LIST

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名 / 規格	Re- marks 備考
C77 ,78 C79 ,80 C81 ,82 C83 ,86 C87 ,88	C55-1747-38 C71-1710-02 C24-1047-61 C71-1727-15 C24-1210-61	CERAMIC 0.047UF Z CERAMIC 10PF D ELECTRO 47UF 10WV CERAMIC 270PF J ELECTRO 10UF 16WV	
C89 -92 C93 -96 C97 -100 C101-104 C105,106	C46-2033-37 C71-1733-05 C24-1210-61 C55-1747-38 C24-1433-71	MYLAR 0.033UF M CERAMIC 33PF J ELECTRO 10UF 16WV CERAMIC 0.047UF Z ELECTRO 330UF 25WV	
C107,108 C109 C111,112 C113,114 C115	C24-1047-61 C24-1210-61 C26-1022-67 C24-1047-61 C24-1210-61	ELECTRO 47UF 10WV ELECTRO 10UF 16WV NP-ELEC 22UF 10WV ELECTRO 47UF 10WV ELECTRO 10UF 16WV	
C116 C117 C119,120 C121,122 C133,134	C24-1022-71 C24-1210-61 C54-2710-39 C90-0417-05 C71-1710-15	ELECTRO 220UF 10WV ELECTRO 10UF 16WV CERAMIC 0.01UF P ELECTRO 7500UF 50WV CERAMIC 100PF J	
C135 C136 C137,138 C139,140 C141,142	C24-1710-51 C24-1410-71 C52-1747-16 C71-1710-15 C55-1747-38	ELECTRO 1UF 50WV ELECTRO 100UF 25WV CERAMIC 470PF K CERAMIC 100PF J CERAMIC 0.047UF Z	
103 3B 104 2B 105 2B 106 2A 107 2B	E11-0070-05 E11-0071-05 E13-0423-05 E13-0612-05 E20-0812-05	PHCNE JACK(MIC) PHCNE JACK(PHCNES) PHCNO JACK(4P) PHCNO JACK(6P) SPEAKER TERMINAL	
108 2B	E06-0510-05	DIN CONNECTOR	
F1 ,2 F1 ,2 F1 ,2 F1 ,2	F05-4021-05 F05-4022-05 F05-6021-05 F05-6322-05	FUSE(4A) X09-1420-11 FUSE(4A) X09-1420-11 FUSE(6A) X09-1420-81 FUSE(6.3A) X09-1422-71	
110 2B 110 2B 110 2B 110 2B	J13-0041-05 J13-0041-05 J13-0055-05 J13-0055-05	FUSE HOLDER X09-1420-11 FUSE HOLDER X09-1421-01 FUSE HOLDER X09-1420-81 FUSE HOLDER X09-1422-71	
L1 -4 L5 ,6	L40-1511-03 L39-0085-05	INDUCTOR COIL	
R29 -32 R93 ,94 R95 ,96 R119,120 R139,140	R43-1233-05 R47-5456-15 R47-5412-25 R43-1222-25 R43-1233-15	FL-PROOF RD33 J 2E FL-PROOF RS560 J 3A FL-PROOF RS1,2K J 3A FL-PROOF RD2,2K J 2E FL-PROOF RS330 J 2E	
R141-144 R145-148 R149-152 R153-156 R157-160	R43-1247-15 R43-1222-15 R43-1239-15 R47-5468-15 R43-1210-15	FL-PROOF RD470 J 2E FL-PROOF RD220 J 2E FL-PROOF RS390 J 2E FL-PROOF RS680 J 3A FL-PROOF RD100 J 2E	
R161-164 R165,166 R167,168 R169,170 R187	R92-0203-05 R47-5422-05 R47-5539-15 R47-5456-15 R47-5422-25	FL-PROOF RS0.47 K 3F FL-PROOF RS22 J 3A FL-PROOF RS390 J 3D FL-PROOF RS560 J 3A FL-PROOF RS2,2K J 3A	
R190 R192 R193,194 R201,202 R207,208	R47-5582-15 R47-5527-15 R47-5556-05 R47-5410-05 R47-5410-05	FL-PROOF RS820 J 3D FL-PROOF RS270 J 3D FL-PROOF RS56 J 3D FL-PROOF RS10 J 3A FL-PROOF RS10 J 3A	
VR1 111 VR2 112 VR3 ,4 VR5 ,6 VR7 ,8	R24-9006-15 R06-5042-05 R06-3019-05 R12-0502-05 R12-1027-05	POT. (VOLUME,MIC) POT. (BALANCE) POT.(TONE) FIG113 TRIMMING POT,100 OFFSET TRIMMING POT, 2K BIAS	*
RL1 S1 S2	S51-2040-05 S42-4011-15 S42-2025-05	RELAY PUSH SWITCH FIG114 PUSH SWITCH FIG115	
D1 ,2 D3 ,4 D5 ,6 D7 ,8 D9 ,10	V11-2200-10 V11-4103-20 V11-0254-05 V11-4103-60 V11-0271-05	SV-22 CZ-225 YZ-140 XZ-051 1S2076/1S1555	
D11 ,12 D13 -15 D16 D17 D18	V11-4103-20 V11-0273-05 V11-0254-05 V11-0295-05 V11-4106-80	CZ-225 1S2076A YZ-140 W068 WZ-162	
D19 -22 IC1 IC2 IC3 ,4 IC5	V11-0465-05 V30-0264-10 V30-0248-10 V30-0435-10 V30-0291-10	GP250/U05C(S) HA1457 NJM4558D(A) STK-0060*1 HA12002	*
Q1 ,2 Q1 ,2 Q3 ,4 Q5 ,6 Q7 ,8	V09-0144-30 V09-0149-40 V03-2320-10 V01-0198-05 V03-2320-10	2SK163(K,L,M) 2SK136(P,Q,R) 2SC2320(E,F) 2SA872 2SC2320(E,F)	
Q9 ,10 Q11 ,12 Q13 -16 Q17 -20 Q21 -26	V01-0999-10 V09-0137-50 V03-2320-10 V01-0999-10 V03-2320-10	2SA999(E,F) 2SK150A(GR,BL) 2SC2320(E,F) 2SA999(E,F) 2SC2320(E,F)	
Q27 ,28 Q29 ,30 Q31 -34 Q35 ,36 Q37 ,38	V01-0999-10 V03-1845-10 V01-0992-10 V03-1845-10 V03-2320-10	2SA999(E,F) 2SC1845(F,E) 2SA992(F,E) 2SC1845(F,E) 2SC2320(E,F)	
Q39	V01-0999-10	2SA999(E,F) FIG116	
SUB (X13-267x-xx)			
S2	S31-2050-05	SLIDE SWITCH Fig.301	

INSTRUCTION FOR PARTS LIST

Ref. No. 参照番号	Parts No. 部品番号	Description 部品名 / 規格	Re- marks 備考
② ① 18 1A	A01-0608-12	METALLIC CABINET	• ③
19 2A	A20-1979-11	FRONT PANEL ASSY	• K ④
19 2A	A20-1979-11	FRONT PANEL ASSY	PM
19 2A	A20-1979-11	FRONT PANEL ASSY	SU
19 2A	A20-1979-11	FRONT PANEL ASSY	XW
⑤ R221	R43-1333-15	FL-PROOF RD330 J 2H	• ⑥
R222	R43-1368-15	FL-PROOF RD680 J 2H	•
VR1 ,2	R12-3301-05	TRIMMING POT, 20K(B)	•
VR3 ,4	R19-4305-05	POTENTIOMETER (OUTPUT)	•
VR5 ,6	R12-2302-05	TRIMMING POT, 5K(B)	•

- ① Exploded view drawing No.
 ② Position in exploded view.
 ③ Symbol of new parts.
 ④ Area to which parts are shipped. Example: A20-1979-11 is the parts No. of FRONT PANEL ASSY for the "K" type products (for USA).
 When this column is blank, it means that the same type of parts (same parts No.) are used for the products shipped to all areas.
 ⑤ Reference No. in schematic diagram.
 ⑥ Abbreviation of "Flame proof metal oxide film resistor". All capacitors and resistors are listed using abbreviations
 ⑦ Abbreviations

* Abbreviations of capacitors (Parts No. with initial letter "C")

ELECTRO	Electrolytic capacitor
LL-ELEC	Low leak electrolytic capacitor
NP-ELEC	Non-pole electrolytic capacitor
MICA	Mica capacitor
POLYSTY	Polystyrene capacitor
MYLAR	Mylar capacitor
CERAMIC	Ceramic capacitor
TANTAL	Tantalum capacitor
MF	Metallized film capacitor
OIL	Oil capacitor

The unit "UF" is used in lieu of "μF".

* Abbreviations of resistors (Parts No. with initial letters "R")

RC	Carbon composition resistor
RD	Carbon film resistor
FL-PROOF RD	Flame-proof carbon film resistor
RW	Wire wound power resistor
FL-PROOF RS	Flame-proof metal oxide film resistor
RN	Metal film resistor
2B	Rated wattage 1/8W
2E	Rated wattage 1/4W
2H	Rated wattage 1/2W
3A	Rated wattage 1W
3D	Rated wattage 2W
3F	Rated wattage 3W
3G	Rated wattage 4W
3H	Rated wattage 5W

All resistor values are indicated with the unit (Ω) omitted.

* Abbreviations common to capacitors and resistors

C	±0.25pF (Used for capacitors only)
D	±0.5pF (Used for capacitors only)
F	±1%
G	±2%
J	±5%
K	±10%
M	±20%
Z	+80%, -20% (Used for capacitors only)
P	+100%, -0% (Used for capacitors only)

- ⑧ Resistors RD (carbon composition resistors) are not listed in the parts list. For values, refer to the schematic diagram

A product of
TRIO-KENWOOD CORPORATION

6-17 3-chome Aobadai Meguro-ku, Tokyo 153 Japan

KENWOOD ELECTRONICS, INC.

1315 E. Watsoncenter Rd. Carson, California 90745, U.S.A.
 75 Seaview Drive, Secaucus, New Jersey 07094, U.S.A.
 1098 North Tower Lane Bensenville, Illinois 60106, U.S.A.

TRIO-KENWOOD ELECTRONICS, N.V.

Leuvensesteenweg 504 B-1930 Zaventem, Belgium

TRIO-KENWOOD ELECTRONICS GmbH

Rudolf-Braas-Str. 20, 6056 Heusenstamm, West Germany

TRIO-KENWOOD FRANCE S.A.

5, Boulevard Ney, 75018 Paris, France

TRIO-KENWOOD SVENSKA AB

Kemistvagen 10A, S-183 21 Taby, Sweden

TRIO-KENWOOD (AUSTRALIA) PTY. LTD.

30 Whiting St., Artarmon, N.S.W. 2064, Australia

KENWOOD & LEE ELECTRONICS, LTD.

Room 501, Wang Kee Building, 5th Floor, 34-37, Connaught Road, Central, Hong Kong